

**ENVIRONMENTAL CONCERNS AND SMALL AND MEDIUM-SCALE
ENTERPRISES IN AWKA, ANAMBRA STATE: AN HISTORICAL STUDY OF
BOBLYN-CHI LIMITED, 2003-2019**

Abuoma C. Agajelu

Department of History and international Studies

Nnamdi Azikiwe University, Awka

Email: a.agajelu@unizik.edu.ng

&

Dr. Nwachukwu J. Obiakor

Department of History and international Studies

Nnamdi Azikiwe University, Awka

Email: nj.obiakor@unizik.edu.ng

Abstract

Small and Medium-scale Enterprises (SMEs) have been identified as a major driver of sustainable economic growth and development. They make employment of skilled, semi-skilled and unskilled labour possible; they are source of internally general revenue (IGR) for the government; and make effective use of idle raw materials, among others. However, the proliferation of SMEs invariably contributes to environmental degradation. Albeit, their contribution to carbon monoxide emission is relatively low in comparison with Large Scale Enterprises (LSEs). The Liquefied Petroleum Gas (LPG) is a source of fuel that is known to be highly combustible and inflammable, thereby making it a possible menace to the environment if not properly handled. Even though the United Nations Environmental Programme (UNEP) has affirmed that the chemical substances found in LPG does not have adverse effect on the environment and even go as far as recommending it as an alternative to wood fuel, the fire outbreak that could result from mishandling of the gas could prove highly socio-environmentally hazardous. Unfortunately, most historical studies on the effects of business activities on the environment appear to focus mostly on the fossil fuel-emitting activities. It is in the view of the foregoing that this study adopts the historical method of research, which basically involves qualitative analysis, to examine some environmental factors in SME activities in Nigeria. Tracing the business history of Boblyn Chi Integrated Services Limited, which is a major LPG dispenser in Awka, Anambra State, the study observes that the company and some gas dispensing SMEs in the state may actually live up to the responsibility of being environmentally conscious. Boblyn Chi, among other things, pays the compulsory annual environmental levy and ensures that the business activities in the company are in line with modalities stipulated by regulatory agencies for socio-environmental protection. The submission of the paper is that Boblyn Chi's Whiz Gas plant being one of the biggest LPG dispensing plants in Awka, has contributed in good measure to mitigate environmental hazards normally associated with SMEs that deal on sensitive materials. Coupled with sensitization of customers on the need to observe safety measures while using the LPG, it also engages in community development and other social responsibilities. However, considering the size of the company and years of operation, it is expected that further safety measures, such as the construction of modern dispensing platform, which is evidently lacking in the Awka plant, be put in place. Furthermore, while private enterprises should accept and perform their obligations to ensure environmental sustainability, government has an enormous role to play towards that end.

Keywords: Environment, enterprise, Anambra State, Boblyn-Chi limited

Introduction

Different governmental policies of the developed and developing economies that are geared towards the broad establishment, expansion and sustenance of the Small and Medium-scale Enterprises (SMEs), appear to have relatively produced positive results. Such policies could be seen in the indigenous Science and Technology (S&T) and Research and Development (R&D) policies that, against all odds, propelled Japan to achieve development in the post-World War II years,¹ thereby placing the nation among the comity of developed nations of the globe. China took a cue from the Japanese and thawed their stance on socialism. Such indigenous SME-encouraging policies as the Torch Programme and the 863 Plan were floated in China and were generally adjudged successful.² The foregoing underscores the invaluableness of a market economy in the economic growth of a country.

Developing economies have been struggling to formulate and implement economic measures that would encourage the emergence of SMEs and equally help build their private sector of the economy. The efforts are sustained by the obvious gains that are accruable from SMEs. These gains could be seen in the ability of the SMEs to make use of idle materials, local raw materials, and to bring employment to the grassroots.³ Since Nigeria is a pro-capitalist economy, it is entirely necessary that the governments initiate workable and feasible policies to solidify the private sector of the economy and in furtherance, encourage the growth and expansion of SMEs. Commenting on the importance of the SMEs on Nigerian economy, D.O. Ayozie averred that the SMEs:

...constitute the fountain head of vitality for the national economy and consequently their problems have been viewed as those of the nation, by virtue of their number, diversity, penetration in all sectors of production and marketing, contribution to employment and to the prosperity of the particular areas in which they operate.⁴

One of the earlier steps that were taken by the post-independence Nigerian government to encourage the development of SMEs was to make it a cardinal point in the 1970-1974 National Development Plan. In that plan, the federal government gave special attention to the development of small scale industries particularly in rural areas. This was in recognition of the roles of SMEs as the seedbeds and training grounds for entrepreneurship.⁵ The primacy of the development of SMEs in the said development plan is deductible from its objectives, which among other things are the following:

- Accelerating the pace of industrialisation and dispersal of industries.
- Generating substantial employment opportunities.
- Promoting individual initiatives and entrepreneurship among the populace.
- Developing and increasing export traders, and
- Complementing large scale industries.⁶

From the foregoing, one can adduce that measures have been initiated to encourage the development of SMEs in Nigeria. Unfortunately, there appears to be a general ignorance on the parts of both the government and the private investors on the negative fallout of the spread of SMEs, especially the manufacturing and services enterprises. The environmental factor remains an area of industrialisation that needs to be under serious consideration if life on the planet earth is to be sustained. This makes it necessary to consider the adoption of economic and environmental history as a sub-discipline or an academic field of study.

Liquefied Petroleum Gas (LPG), which is popularly known as “cooking gas” in Nigeria, has come to be a common commodity of distribution and retail in the Nigerian downstream oil private sector. The ready acceptability of LPG in the market was as a result of its popular domestic use and this goes further to make it an attractive area of investment for SMEs in Nigeria. However, LPG is a highly inflammable substance. This makes it a strictly monitored and regulated trade item, though its direct chemical effects on the environment is not known to be adverse. This study goes on to examine the activities of Boblyn Chi Integrated Services Limited (which is an accredited dispenser and retailer of LPG) in Awka, Anambra State, in relation with human and environmental protection. Boblyn Chi Integrated Services Limited is one of the pioneer LPG dispensing companies in Awka. The company did not actually start up with the name Boblyn Chi Integrated Resources Limited, but rather Whiz Gas Limited. Whiz Gas Limited actually established the first LPG dispensing plant in Awka. It was established in 1994 but was leased to Boblyn Chi about a decade later, even though the staff and mode of operations of Whiz Gas were retained.⁷

Literature Review

There are extant studies on the effects of industrial activities on the environment. However, authors tend to expend maximum efforts in analysing the business activities of Large Scale Enterprises (LSEs) in relation to environmental impact, while the contributions of SMEs on environmental sustainability or degradation are generally unstudied. The foregoing notwithstanding, some existing literature draw some insight into the present study.

Richard K. Blundel, Adrian Monaghan and Christine Thomas connect environmental consciousness of private firms with their business policies. They examine how policy tools are being used to improve the environmental performance of SMEs and to redirect entrepreneurial energies in more environmentally benign directions.⁸ A cursory observation of SMEs in Anambra State may indicate lack of entrepreneurial energies directed towards business practices that are environmentally friendly. Nonetheless, the government of the state has put up measures, albeit satisfactorily, to regulate the environmental impact of these business concerns.

Polina Baranova and Fred Paterson explore SMEs environmental practices, environmental capabilities and awareness of the regional support for green growth. Baranova and Paterson go on to point out that majority of SMEs did not access governmental grants to improve energy efficiency in the area studied, which is the East Midlands region of the United Kingdom.⁹ What this implies in essence is the existence of governmental grants focused on encouraging environmentally friendly business practices among SMEs. Evidently, such governmental effort is lacking in Nigeria. Some staff of Boblyn Chi actually decries government ineptitude in handling the environmental question in business activities.¹⁰

At this juncture, it would be necessary to explore some literature that explicate the concepts of SMEs and LSEs for better understanding. The concepts of SME and LSE have been variously defined. The divergent definitions reflect the subjective views of economists on what constitutes a SME or a LSE. Nonetheless, there are some determining factors which could guide one in categorising these enterprises. Some of these determining factors are explicated by D. O. Ayozie, S. J. Oboreh, F. Umukoro and V. U Ayozie, as “capital outlay, number of employees, sales turnover, fixed capital investment, available plant and machinery, market share and the level of

development.”¹¹ The authors go on to assert that the Third National Development Plan in Nigeria defines a small scale business as “a manufacturing establishment employing less than ten people, or whose investment in machinery and equipment does not exceed six hundred thousand naira.”¹² B.A.N. Onugu opines that “Nigeria’s SMEs cover enterprises with total cost of N200million excluding land and total employees of between 10 and 300 people.”¹³ He further posits that LSE is:

...any enterprise whose total cost including working capital but excluding cost of land is above three hundred million naira (N300,000,000) and/or a labour force of over two hundred (200) workers and/or an annual turnover of more than twenty million naira (N20,000,000) only.¹⁴

These divergent views show how difficult it would be to reach a consensus as to the actual definition of SME and LSE. Nonetheless, one can distinguish SME and LSE based on some of their basic features. SMEs are distinguished by the following features:

- *Ownership and Management to SMEs:* The chief executive generally participates actively in the decision-making process and day to day operation of the firm with little or no adequate specialist support. The chief executive can be known by all employees of the company or organization. The chief executive is the owner, founder and manager as well as the controller of the business.
- *The Scope:* SMEs cut across the industrial sector although the majority is agro- allied and food processing. There are quite some wood products and product furniture, in non-metallic mineral, in plastic wares, in clothing, tailoring, and the rest. Considering the facts that they form a large pool of indigenous enterprise and technical know-how and a breeding ground for entrepreneurial management, the SMEs sector needs to be supported and prepared for the uprising in economic activities in Nigeria.¹⁵

Liquefied Petroleum Gas (LPG) is the principal item of discussion in this study. According to the United Nations Environment Programme (UNEP), Liquefied Petroleum Gas (LPG) can be defined as a blend of Propane (C3’s) and Butane (C4’s) readily liquefied under moderate pressure or is the over head of the gasoline stabiliser and used as fuel in heating appliances and vehicles as well as refrigerants and at the same time provided the petro-chemicals industries with different feed stocks. LPG is heavier than air and will flow along floors and tend to settle in low lying places which can cause suffocation or ignition hazards. LPG evaporates at normal ambient temperature and pressure and the ratio between the volume of the vaporised gas and the liquefied gas varies depending on the composition, pressure and temperature but typically around 250:1.¹⁶

LPG burn cleanly with no soot and very few sulphur emissions and no ground or water pollution hazards and has been a popular choice of fuel for over 60 years due to its flexibility, convenience and environment advantages. LPG is recognised by governments around the world for the contribution it can make towards improved indoor and outdoor air quality and reduce green house gas emission. LPG is used in the following areas:

- Fuels: As heating, power generation and cooking...
- Source of Petro chemicals feed stocks: LPG precisely that produced by the RFCC unit provides significant source of olefins particularly propylene and butylene.¹⁷

Theoretical Framework

Considering the increasing impact of industrial activities on the ecosystem and the further proliferation of SME manufacturing and services industries in developing economies in the modern times, the present study considers the analysis of the activities of Boblyn Chi Integrated Resources Limited and its environmental implications using the ecological modernisation theory. The ecological modernisation (EM) theory was postulated in the 1980s as a response to the Club of Rome's "limit to growth" argument, which believes that ecological considerations would only be inimical to industrial output and economic growth. Regarding the dispelling of the "limit to growth" argument, Arthur P.J. Mol writes:

Several empirical studies identify from the 1980s onward a rupture in the long established trend of parallel economic growth and increasing ecological disruption in most of the ecologically advanced nations, such as Germany, Japan, the Netherlands, the US, Sweden and Denmark. This slowdown is often referred to as the decoupling or delinking of material flows from economic flows.¹⁸

In other words, in the full glare of the global threat of toxic emissions from industries, there was the urgent need to innovate measures to safeguard the environment while the process of industrial growth is not interrupted. Joseph Huber, Martin Janicke and Udo Simonis, who are the principal proponents of the EM theory, assert that through human ingenuity the economy could continue to grow whilst also ensuring environmental protection.¹⁹ They go on to claim that this would be achieved through resource efficient technical innovation that would allow greater productivity to occur without the need for more material and energy usage, thereby de-linking economic growth from environmental degradation.²⁰ Considering the juicy prospects of the EM theory, it has developed considerably to become a mainstream theory within disciplines that focus on socio-environmental relations.²¹

Along the line of the submissions of EM theorists, the Nigerian LPG regulatory boards have directed that gas, which contains a higher quantity of the highly combustible and environmentally harsh propane, should not be dispensed in LPG plants. In the bid to abide by the regulations, contribute to environmental and social safety and also to establish an integrity for the Boblyn Chi brand, the management of the company made it a policy to eschew the purchase and dispensation of high propane gas, even though it was evidently cheaper.²² While Boblyn Chi Integrated Services Limited has been recording relative high sales, basically due to its established fame of selling "undiluted" gas,²³ the company has obviously put up some efforts that would minimise environmental degradation. More of these efforts are explicated in the subsequent sections of this study.

A Brief Overview of the Environmental Factor in the Small and Medium-Scale Enterprises in Nigeria

Beth Walker, Janice Redmond, Lynnaire Sheridan, Calvin Wang, and Ute Goeft, with appropriate references, strengthen the notion that small and medium-scale enterprises (SMEs) are the backbone of any capitalist economy with the following words:

Small and medium enterprises are the largest business sector in every economy in the world, and generate the majority (up to 60%)

of global economic output. In the Australian context, a small business or enterprise is one that employs up to 20 staff while a small and medium sized enterprise (an SME) is a business that employs up to 200 staff. By this definition, more than 99% of all actively trading businesses (more than 1.95 million enterprises) in Australia are SMEs.²⁴

Even though the authors present SMEs in the Austrian context, their submission goes a long way to provide an insight on the contributions of SMEs to an economy. Suggesting that more than 99 per cent of all active trading businesses in Australia are SMEs, Walker *et al* have underscored the need to conduct a similar statistical research in other business climates. However, that is not the purpose of the present study, though the statistic has provided a pointer to the possible impact of SMEs on the Nigerian economy. The environment plays a good role in the growth of SMEs. Environmental factors can help to determine the extent of success or failures of a budding private enterprise. Such environmental factors may include the topography of the business site, the demography and proximity to consumer population, the predominant climatic condition, and infrastructure among others. Using the topography of business site as an example, a growing industry sited on a difficult terrain may hinder supplies and discourage distributors and other buyers.

In Nigeria, environmental considerations have been shown to have played a major role in the poor performance of SMEs and go on to discourage private enterprises. AbubakarSalihu points out some of the internal and external environmental factors that affect SMEs in Kano and Sokoto states of Nigeria, even though he unduly gave attention to what may be regarded as human factors such as skill acquisition and managerial capabilities.²⁵ However, the activities of the SMEs also go some length in impacting on the environment and adequate academic attention has not been given to the effects of the operations of SMEs on the Nigerian environment. Considering the spread of SMEs, the volume of industrial activities surrounding them and the general impact they have on the economy of a state, it is imperative that their attention to environmental and social responsibilities is called.

Some of the fallouts of carbon monoxide emission are the acid rain. In the parts of Nigeria where acid rain is experienced, there is evidence of heavy emission that underscores intense industrial activities. The industrial activities cannot only be credited to the Large Scale Enterprises (LSEs). The different SMEs probably contribute a great deal to the emission, considering their number and the way they are spread out in geographical area. Kelechi Ngwu, who is an offshore staff of Total Oil Servicing Company, commented that the effects of carbon emission are evidenced on the rustiness of the metallic roofs of houses and vehicles in and around Port Harcourt. He also claimed that his employers are aware of the adverse effects of their industrial activities on the environment and have designed laid down programmes to mitigate the effects,²⁶ though nothing was said on plans to minimise emission. Unfortunately, the SMEs appear to be oblivious of the impact of their economic or industrial activities on the environment. It appears that the environmental responsibility was left for the LSEs and multi-national corporations (MNCs) in Nigeria.

Also, there are some SMEs in Nigeria that deal on products that could have immediate devastating impact on the environment. One of the most popular of these products is the liquefied petroleum gas (LPG). Considering the direct destructive impact the LPG could have on the environment, the government of Nigeria has mandated various ministries and agencies to ensure good practices in the LPG plants. Some of these ministries and agencies include: the Ministry of Environment, the Ministry of Health, National Emergency Management Agency, the state fire departments, National Health Insurance Scheme among others. The government also goes on to initiate some schemes that would protect the health of LPG workers. One of such schemes is the compulsory integration of every LPG worker into the National Health Insurance Scheme (NHIS). NHIS covers the cost of the treatment of any ailment that came as a result of a staff's exposure to LPG.²⁷ There is also the Nigerian Social Insurance Trust Fund (NSITF) which also demands compulsory membership of every LPG worker. The fund also takes care of medical expenses and in addition, would cater for a member LPG worker's funeral in case of death from gas plant accident.²⁸ If the deceased worker had a spouse and children, the fund takes care of the education of the children until the last child is twenty years old. The deceased spouse continues to be paid the amount of salary which the former was receiving before his/her demise.²⁹

Even though the LPG does not contain carbon monoxide that is known to be environmentally harmful, other properties of the gas such as propane should not be excessively inhaled. This is prone to create health hazards for the LPG workers and also possibly endangers the health of the general population proximate to the plant or industry. For this reason, a LPG plant is compulsorily meant to pay an environmental pollution levy to the state government called the Annual Levy of Gaseous Emission (ALGE). In Anambra State the ALGE is placed on one hundred thousand naira (N100,000.00) annually. The levy is meant to be invested in measures to fight environmental degradation and climate change in various states of Nigeria.³⁰ There are also some associations formed by the LPG marketers whose responsibilities are, among other things, to ensure social and environmental responsibility among LPG marketers. Such association is the Nigerian Association of Liquefied Petroleum Gas Marketers (NALPGAM).³¹

Brief on the emergence of Boblyn-Chi Integrated Resources Limited

Liquefied petroleum gas (LPG) appears to be a profitable commodity suitable for Small and Medium-Scale Enterprise (SME). The prospective profitability of the LPG lies on its utility, and this makes it a domestic resource of everyday use. In other words, the LPG appears to enjoy a ready demand in the market. Those who have engaged in an effort to market a product or products from SME are familiar with the struggle to ensure market acceptability of a new product or a new brand of a particular product.³² However, the LPG may need no branding and its utility value needs minimal advertising. This makes it a top choice for investment by those who desire to establish SMEs. Nonetheless, the establishment of a LPG plant is capital intensive, and this may have been responsible for SME investor's wariness in investing in the business, but also this makes the story of the emergence of Boblyn Chi Integrated Resources Limited an intriguing one.

Even though the SME under study did not originate from Awka, its biggest and most productive plant, which is the Whiz Gas plant, is located in the city. Considering the meagre capital that was available to the Chief Executive Officer (CEO) of Boblyn Chi Integrated Resources Limited, one may not have expected that the company could grow and expand to its present form. The CEO,

Bob Onyemuwa first engaged in business apprenticeship, popularly known as *boy* in the business circles of South-East Nigeria or in the parts outside the South-East where there are clusters of Igbo business concerns. After fifteen years of apprenticeship in Kaduna, he got “settled” with the sum of two hundred thousand naira (N200,000.00) in 1998.³³

Considering the fact that establishment of a LPG plant is capital intensive, the sum of N200,000.00 appears to be quite infinitesimal. According to Dr. Ifeanyi Eric Okoye, who has been in the LPG business since 1988 and who is equally the CEO of a Large Scale Enterprise, Juhel Nigeria Limited, “it would cost an investor about a million naira to set up a standard LPG plant in the late 80s”.³⁴ Dr. Okoye goes on to point out certain production forces that must be on ground to keep a LPG plant up and running. Such production forces include land, specified pattern of shelter, LPG reservoir tank(s) or a tank farm, office spaces and possibly haulage vehicle. Then there is the need to have an initial work force that may not be up to five persons. These include a supervisor, a dispenser, a cashier and possibly a driver.³⁵

Bob affirmed that the N200,000.00 settlement fund was not enough to purchase a truck of LPG, which he said was sold at N800,000.00 at that time.³⁶ The CEO then took an action, which may be considered repugnant to any law of business enterprising. According to him, after due considerations, he decided to “sow” the entire N200,000.00 as “seed” in a church and started all over to struggle, this time not as an apprentice. He started by doing menial jobs at NNPC refinery, Port Harcourt, Rivers State.³⁷

While at the refinery, Bob met with some oil investors and expatriate oil workers who admired his diligence and hard work. Some of them like Donald Onyekwe and Maxwell Holmes gave him appreciable amounts of money. Similarly, a friend of Bob’s by the name Austin Okorie, mortgaged his property, which enabled him procure a bank loan of N2.7 million from United Bank of Africa (UBA) for Bob. Combining the money from his benefactors and his personal savings, Bob was able to rent a LPG plant in 2003. The plant which was located at Obigbo Road, Port Harcourt, was known as F and B Gas Plant.³⁸

Bob’s intrinsic knowledge of the LPG business ensured his ability to attract benefactors to himself, and this underscores a very important aspect of entrepreneurship. Dirk De Clercq and Pia Arenius show how close contact with an entrepreneurial community could enhance business knowledge in prospective entrepreneurs. They affirm that “knowledge-based factors indeed have a strong impact on the decision to engage in business start-up activity.”³⁹ From the narrations of the CEO of Boblyn Chi Integrated Services Limited, Bob Onyemuwa, his close contact with an entrepreneurial community, which is Port Harcourt and the knowledge-based factor, precipitated his diligence and hard work, which in turn spurred his benefactors to empower him with the much needed capital to start up his enterprise. Furthermore, Bob’s product knowledge abilities enabled him to render some crucial services to the gas dealers, who in turn remunerated him with some stipends that formed part of his start-up capital.⁴⁰

Bob held the F and B Gas Plant on lease for some years before he finally bought it in 2016. Currently, Boblyn Chi Integrated Services Limited has seven different branches and these branches

are held on lease while the F and B Gas Plant, which turned out to be the headquarters of the company, is wholly owned.⁴¹

Boblyn Chi Integrated Services Limited and the Anambra State Environment

The LPG is a petroleum product that has a lot of impact on human beings and the environment. As noted in an earlier section of this paper, it is highly inflammable, thereby demanding careful attention to details. Locating a LPG plant or skid plant and dispensing the product are closely monitored by appropriate government agencies in Nigeria under the Health and Safety Work Act.⁴² The storage tank and service pipework comprise the main aspects of an LPG plant. Care is taken to ensure appropriate installation of the tank, service pipework and their maintenance. After acquiring an operation licence, the management of Boblyn Chi Integrated Services Limited went on to ensure that storage tank and service pipework at the leased F and B plant were in a good condition and were installed appropriately. Regarding the storage tank, among the factors considered were:

- Siting of the tank
- Ventilation and conditions around the tank
- Bridger access
- Security
- Impact protection
- Emergency arrangements⁴³

As regards siting of the storage tank, the legal framework for operating a LPG plant provided that there should be a minimum distance called the separation distance, between the tank and any building, boundary line or fixed source of ignition.⁴⁴ Bob points out that many plants do not observe this legal framework and this was usually because of lack of space.⁴⁵ The Boblyn Chi's F and B plant in Port Harcourt is particularly small but the management of the plant ensured that siting of the plant was in line with the legal framework.⁴⁶ According to Bob, among the plants he leased, the only standard one as at the time of lease was the Whiz plant in Awka. The plant has a tank farm of two 5,000 litres storage tanks. The tanks were sited about 3 metres away from the closest building, which is the dispensing platform.⁴⁷

As regards the ventilation of the tanks, the management of Boblyn Chi ensures that the storage tanks are sited in open space without any form of shelter. There is also a source of water close to the tanks, which sprinkles water on them at various times. The tanks are more frequently sprinkled during the hot season. The water serves as coolant and ensures that the tank does not absorb too much heat.⁴⁸ It is also necessary that the environment where the tank is installed is put into consideration. There should not be drains or gullies near the tank unless a water trap is provided to prevent gas entering the drain. The reason given for this is because LPG is heavier than air and if a leak were to develop from the tank or its controls or pipework or when it is been filled, the vapour could accumulate in an untrapped drain or gully. Ignition of the vapour could lead to fire or explosion.⁴⁹

Bob affirms that he is knowledgeable about the need to improve the condition of the environment near a bulk storage tank. An observation of the Boblyn Chi leased plant in Awka, which is the Whiz gas plant, shows that the company endeavours to comply with the standard modalities of the

installation of tanks, their maintenance and the upkeep of the environment where they are installed. The grasses are periodically mowed and the company has a policy of avoiding the use of weed-killers to check the grasses. This is because of the chlorate-content of some of the weed-killers, which could make the dead grasses easy to ignite.⁵⁰

In order to trap the gas inside the storage tank in case of ignition or fire outbreak, they are to be installed with a lockable valve cover known as the safety release valve. However, inquiries have shown that many LPG plants in Nigeria do not install or are yet to install the safety release valve on their storage tanks. The general reason given was that the technology was newly introduced in the country, thereby making it scarce and costly.⁵¹ In fact, a major disaster was averted in the headquarters of Boblyn Chi in Port Harcourt because the storage tanks there were installed with the lockable valve cover. The incident took place in 2016 when there was a minor explosion in the dispensing platform of the F and B plant. It was said that the flame from the explosion was not in the air up to thirty seconds but within that period of time much damage had been done. Seven lives were lost but there were no property damages because of the briefness of the flame in the air. This raises the question of the lethality of LPG on human being when inflamed. However, because the safety release valve was installed on the storage tanks, the flame could not penetrate to cause a major explosion.⁵²

In line with good operation practices as provided by the legal framework for operating a LPG plant to ensure safe environment, the management of Boblyn Chi Limited endeavours to adopt safety measures while the discharge of gas from a gas bridger to the storage tank is going on. In the different LPG plants of Boblyn Chi Limited there is a dedicated flat parking area for the bridger delivering LPG. Some safety measures are taken prior to the delivery day such as clearing the area where the bridger parks to deliver, suspending dispensing and sales of the product on the platform, and ensuring minimal cluster of people around the bridger and the tank farm. Care is taken to make sure that the bridger does not drive away with the supplying hose still connected, that there is no risk of an electrical spark being generated from static electricity or by other means. This emphasises the need to make sure that the team of suppliers, which basically include the driver and conductors of the bridger, are adequately trained on the procedures of filling and discharging gas from the bridger.⁵³

There is also a basic need to provide adequate security for the tank farm. Non-staff members of Boblyn Chi are allowed anywhere close to storage tanks. In like manner, vehicles are not allowed to park close to it. To ensure this, there is a yellow line barricade in all the branches of the company. Care is also taken to ensure that there are no electrical installations close to the tank and in addition “No Smoking” signs are boldly placed around it. Emergency arrangements are compulsorily put in place. There are automatic fire extinguishers hung at designated spots. In the case of leak or fire outbreak, the fire service number would be dialled immediately while the plant would be evacuated. The tackling of fire is left for the fire service unless it is judged that it can be easily put out without endangering anybody.⁵⁴ Another important aspect of the gas plant that can easily have an impact on the environment is the service pipework. The service pipework at a LPG plant is the piping system that carries LPG vapour from the bulk storage tank to the dispensing platform.⁵⁵ As stated in an article by the British Health and Safety Executive:

The main concern with service pipework is that if it is damaged it is likely to release the LPG it is carrying. If the escaping LPG vapours were to ignite, the LPG could then cause a fire or explosion. Damage to the pipework could be caused by physical impact or through chemical means, for example corrosion of a metal service pipe.⁵⁶

The sensitive place of the service pipework in a LPG plant makes the management of Boblyn Chi to adopt measures that would ensure its safety and maintenance. Among the basic considerations to ensure the safety of the service pipework are: installation route, materials of construction, pressure, inspection and maintenance, replacement, and entry into the premises.⁵⁷ The aforementioned considerations are in the main the responsibility of the LPG dispensing firm.⁵⁸ Ideally, LPG service pipework should be run above ground using a route that minimises the possibility of physical damage, for example from vehicles, and away from excessive heat or cold.⁵⁹ In accordance with this, the service pipework at Whiz Gas Plant, Awka could be clearly seen on the surface and the C.E.O of the company, Bob affirms that it is so in all the branches of Boblyn Chi Limited.⁶⁰ The service pipework at Whiz Gas is also done in a location where it cannot have contact with humans or vehicle and other moveable objects.

The material the pipework is made from is very important, particularly if it is buried. In general, steel or copper can be used for pipework that runs above ground.⁶¹ The surface service pipework at Whiz Gas is also made of steel. This helps to ensure that pressure from LPG does not cause leakages. Furthermore, there is regular inspection and maintenance of the service pipework in all the branches of the company.⁶²



Part of the service pipe at Boblyn Chi's Whiz Gas Plant, Awka. Here the mechanism which facilitates the passage of LPG from the tank to the dispensing platform is installed

Considering these measures, Boblyn Chi Limited could be adjudged environmentally conscious. Nonetheless, the floor of the dispensing platform of Whiz Gas Plant is lower than is recommended. It is recommended that the floor of the platform should be at least three feet above ground level. The management of the branch affirms its plan to raise the floor of the platform. In like manner, it appears that there is no designated area for vehicles to park in the plant. Furthermore, the F and B Gas Plant of the Port Harcourt branch is said to be small in area, thereby requiring expansion.⁶³



The LPG Dispensing Platform at the Whiz Gas Plant, Awka

Social Responsibility of Boblyn Chi Integrated Services Limited

Since Robert Owen backed up the rhetoric of social responsibility with actions in the 19th century, when he became the first manufacturer to seek the welfare of his workers outside the plant situation,⁶⁴ the trend of worker-welfare consciousness and social responsibility became popular among industrialists. With this trend, large scale enterprises (LSEs) as well as SMEs increasingly have the moral burden to accept social and environmental responsibilities. Apart from the community development services required of them by the law, conscientious ones go a long way to provide succour to humanity in various ways.

The management of Boblyn Chi Integrated Services Limited made it a policy to put the safety of its workers first. Apart from the compulsory registration of each member of the staff to the NHIS and NSITF, as mentioned in an earlier section of this paper, the company went ahead to adopt internal measure that would ensure the welfare of the staff. One of such measure is the compulsory fire drilling exercise. The adoption of the fire drilling exercise was done in the view of the awareness that commonest accident experienced in gas plants is explosion and a resultant fire outbreak.⁶⁵

Furthermore, the health hazards on workers due to the constant inhalation of LPG are not lost on the management of Boblyn Chi Investment Nigeria Limited. There is the claim that excessive inhalation of LPG causes venereal worm infection in humans.⁶⁶ The company, therefore, distributes two tins of milk and a bottle of soda water to each member of its staff every week to help in the detoxification of their internal organs to prevent the venereal worm infection.⁶⁷ To validate the health hazard claim attributed to LPG inhalation and the potency of milk and soda water against the health situation, the plant manager of Whiz Gas Plant, Awka, Chidozie Anagbogu stated thus, “...every time we go on annual health training with the NNPC, they keep emphasising on the need for gas plants to distribute tins of milk to their employees.”⁶⁸

To ensure the on-the-job safety of the worker, Boblyn Chi provides the full work kit recommended for each LPG dispensing staff. A full work kit comprises of protective helmet, facial (nose) mask, special coverall garment and safety boots.⁶⁹ The company also ensures the constant supply of potable water as dehydration normally accompanies exposure to LPG.⁷⁰

Boblyn Chi's efforts to ensure the safety of its customers are seen in the quality of gas accessories on sale in the plants and the quality of maintenance services they offer to customers. The company gives particular attention to the quality of gas cylinder it sells. The Standard Organisation of Nigeria (SON) approved the following categories of cooking gas cylinders for domestic use: 3kg cylinder, 5kg cylinder, 6kg cylinder, 10kg cylinder, 12.5kg cylinder, 25kg cylinder and 50kg cylinder.⁷¹ These sets of cylinders are all on sale in different branches of Boblyn Chi Integrated Services Limited. However, SON also provided specification for welding works on the cylinders. The specification is that 3kg, 5kg, 6kg, 10kg and 12.5kg cylinders should not have more than one welding point, while 25kg and 50kg cylinders should not have more than three welding points. This is to ensure that the highly combustible LPG contained in it would not leak or explode.⁷² Unfortunately, some marketers sell some of these cylinders with more than one welding point. Also some users are in the habit of attempting to repair already expired cylinders. Anagbogu suggests that a prospective buyer of the specified cylinders should ensure that it does not have more than one welding point.⁷³ There was a case of an incident where a customer's 6kg cylinder exploded on getting home after refilling it with LPG because the cylinder had multiple welding points. However, the management of Boblyn Chi affirmed the customer did not purchase the cylinder from the plant.⁷⁴ An observation, by the researcher, of the cylinders displayed for sale at the Whiz Gas Plant of the company shows that they are all compliant with the said regulation of SON.

The management of Boblyn Chi also adopts it as a policy to contribute to the community development of the places where each of the gas plants were located.⁷⁵ They engaged in such activities as sanitation, road maintenance, drainage maintenance and so on.⁷⁶ The management also has a loan package for the staff. These loans are accessible by a member of staff that has been with the company for a certain period of time and with certain performance record. The management also provide welfare packages for the staff and customers during festive seasons, especially Christmas.⁷⁷

Conclusion

One of the obvious off-shoots of the industrialisation process is incremental environmental degradation. While the industrialised developed Organisation for Economic Cooperation and Development (OECD) countries appear to effectively engage in attempts to innovate measures that would encourage the development of SMEs and at the same time ensure socio-environmental protection (as could be seen in the ecological modernisation theory), developing economies keep on emphasising on industrialisation as key to sustainable development without giving due attention to its impact on the environment. As advocated by the EM theory, industries are to pay environmental tax to the government to enable it sponsor innovations that would enhance environmental protection.⁷⁸ The environmental tax is also paid to the Anambra State government and Boblyn Chi Integrated Resources Limited pays the sum of one hundred thousand naira (N100,000.00) annually to the state government as the Annual Levy of Gaseous Emission (ALGE).⁷⁹ However, it appears that such funds are not put into proper use as environmental protection policies remain at the backburner of the state's policy considerations.⁸⁰

On a positive note, Boblyn Chi has contributed to socio-environmental safety of the area where its plant is located at Industrial Layout, Awka through ensuring that the company dispenses the

approved low propane LPG. The company also engages in community development and also ensures the safety of its staff members. Furthermore, through the distribution of LPG, which has been proved to be a more environmentally friendly source of fuel, Boblyn Chi has contributed enormously to environmental preservation in Awka, Anambra State. The management of the company makes it a marketing strategy to educate prospective users of LPG on the need to discourage deforestation through abandoning the wood fuel and also the safe measures that could prevent domestic disasters associated with the use of LPG.⁸¹ The UNEP has made it clear that LPG is a healthy alternative to the greenhouse effect occasioned by deforestation that was partly caused by the use of firewood fuel, especially in Africa.⁸²

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